# VILLAGE OF WOODVILLE GROUND WATER SURVEY

TD 227 .WGG 1977



The Honourable George A. Kerr. Q.C.. Minister

K.H. Sharpe, Deputy Minister

TD 403 .06 W66 1997 stacks

# MINISTRY OF THE ENVIRONMENT

VILLAGE OF WOODVILLE

I

GROUND WATER SURVEY

D.J. ANDRIJIW

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact Service Ontario Publications at <a href="mailto:copyright@ontario.ca">copyright@ontario.ca</a>

### TABLE OF CONTENTS

I

ſ

I

I

Page	1	Introduction
	1	Present Supplies - Evaluation & Potential
	4 4	Geology - Bedrock - Overburden
	5 5 6	Hydrogeology - General - Bedrock - Overburden
	7	Water Quality - Chemical
	8	Favourable Test Drilling Areas
	8	Conclusions
	9	Recommendations

# APPENDICES

Table 1 - Table	of	Water	Well	Reords
-----------------	----	-------	------	--------

- Table 2 Summary of Chemical Analyses
- Figure 1 Well Locations & Favourable Test Drilling Areas
- Figure 2 Precipitation, Average Daily Demand, Water Levels

#### MINISTRY OF THE ENVIRONMENT VILLAGE OF WOODVILLE GROUND WATER SURVEY

#### INTRODUCTION

At the request of the Village of Woodville through the Ministry's Central Region Office, a ground water survey was undertaken to determine the potential of the existing well water supply and if necessary, to locate potential sites within an economic distance from the Village for additional municipal well-water supplies to meet future demands.

The evaluation of the potential of the aquifer was based on data derived from the previous test drilling program and the pumping and water level data from the existing wells. The study to determine other potential water supply areas was based on field examinations and available hydrogeologic data. The study was confined to an area within a radius of about 2 miles (3,2 km.) of the Village of Woodville. Water well records, togographic maps and geologic reports were utilized. A field reconnaissance was made to observe geologic and topographic features. Water samples were collected from wells in the vicinity to determine the chemical quality of ground water in the area.

The water well records used in the study area are listed in Table 1. The location of each well is shown in Figure 1. The well numbering system used in this report relates to the permanent well coding numbers of the Ministry of the Environment.

# PRESENT SUPPLIES - EVALUATION AND POTENTIAL

The present municipal water supply system in Woodville consists of a 30-foot (9, 1m) deep well, TW-6-69, drilled into the bedrock. The overburden at this site was 12 feet (3,7m) thick with the main water-bearing zone being the top of the bedrock. This well was tested and found to be capable of yielding 75 gpm (5,7 1/s) on a perennial basis and is presently equipped to pump this quantity of water.

In determining the potential of the present water supply well and the well field, the daily pumpage figures and water level data for the last three years were reviewed. It became immediately apparent from the data that the operational procedure used at the well was unusual. Up until 1977, the well was not pumped daily but rather intermittently between lapses of up to six days. Thus when the well was pumped for a one-day period, flows exceeding 90,000 gallons per day (gpd) (409,131 1/d) were recorded. A cursory examination of the data would therefore suggest that the maximum daily demand was approaching the maximum daily yield of the well, 108,000 gallons (490,957 1). Most of the daily pumpages tabulated, including the so called maximum-day pumpages, therefore do not represent actual daily consumptions. In 1977 the pump operation becomes more daily as the daily pumpage increases and as the ratio between storage and water use becomes smaller.

One estimate of the average daily consumption was made by dividing the total quantity of water pumped during the month by the number of days in that month. Figure 2 shows the graphed results. The figure also shows the total monthly precipitation and the maximum and minimum monthly water levels recorded in the observation well (TW-5-69). This graph indicates that although the average daily demand has been increasing, the average demand has not exceeded 30,000 gpd (136,377 1/d) as of February, 1977.

Another attempt to determine the average-day and maximum-day consumption was made by averaging the actual daily recorded pumpage over the preceeding days when no pumpage occurred. The calculated daily pumpages along with the reported daily pumpages were grouped according to the number of days. The results for 1975 and 1976 are as follows:

Actual or Calculated	Number of Pumpage O	
Daily Pumpage	1975	1976
<20,000 gallons (90,918 1)	219	227
20,000 to 35,000 gallons (90,918 to 159,107 1)	124	88
35,000 to 60,000 gallons (159,107 to 272,759 l)	22	51
60,000 gallons	5	7

These results indicate that 86% of the time or approximately 315 days during 1976, the daily consumption did not exceed 35,000 gpd (159,107 1/d) while the maximum day consumption may have been in the order of 60,000 gpd (272,754 1/d) for 51 days. The maximums calculated daily consumption was 69,000 gallons. This would then leave approximately 48,000 gpd (218,203 1/d) for future use from the existing well. A second well, TW-5-69, located 362 feet (110,3m) away from the production well, is 38 feet (11,6m) deep and is drilled 20 feet (6,1m) into the bedrock. This well also encountered a water bearing zone within the first few feet of the bedrock surface. The well was tested and found to yield 40 gpm (3,0)1/s on a perennial basis. This well is at present not equipped for production purposes. The consulting hydrologist calculated that if both of the wells were pumped simultaneously, then TW-6-69 should be pumped at 50 gpm (3,8 1/s) and TW-5-69 at 40 gpm (3,0 1/s) for a combined yield of 90 gpm (6,8)1/s.

Because the water-bearing zone occurs within the first few feet of the bedrock surface, the consulting hydrologist recommended in his report on the test drilling project that the water levels should not be allowed to drop more than 3 feet (0,9m) below the bottom of the casing in each well. These levels are calculated to be 21 feet (6,4m) and 15 feet (4,6m) for TW-5-69 and TW-6-69, respectively.

At the time of the test drilling and testing of these wells (late spring and early summer, 1969) the static water level in TW-5-69 and TW-6-69 was 8.4 feet (2,56m) and 8.1 feet (2,47m) below ground level, respectively. A water level recorder was placed on TW-5-69 in 1972. The water level data (Figure 2) indicate that water levels fluctuate annually and are as much as 6.16 feet (1,9m), with the water level attaining a high of 5.60 feet (1,7m) below ground surface in the spring and a low of 11.76 feet (3,6m) below ground surface (1975 data) in the fall. It is assumed that this water level fluctuation is due to seasonal causes and is also occurring in the production well.

From the pumping tests conducted in TW-5-69 and TW-6-69, the consulting hydrologist calculated the effective transmissivity of the aquifer in the area of the two wells to be in the order of 2.0 to  $3.0 \times 10^4$  gpd/ft. (298 to 447 m<sup>2</sup>/day). The aquifer coefficients were used in the present prediction of pumping water levels rather than the drawdown trends as used by the consulting hydrologist in his report. Assuming the more conservative transmissivity of 20,000 gpd/ft. (298 m<sup>2</sup>/day) the production well, being pumped at 75 gpm (5,7 1/s) continuously for 1 year, would have a calculated drawdown of about 8 feet (2,4m). If the main production well was to be pumped at 50 gpm (3,8 1/s) and TW-5-69 at 40 gpm (3,0 1/s), after 1 year of continuous pumping the drawdown in each well, including mutual interference is calculated to be 7.46 feet (2,3m) and 11.16 feet (3,4m) respectively.

- 3 -

From the test drilling program, the consulting hydrologist recommended that the water level in TW-6-69 and TW-5-69 should not be lowered below 15 feet (4,6m) and 21 feet (6,4m) below ground level during pumping. The data from the recorder have shown that the water level may lower to as much as 11.76 feet (3.6m) below ground surface. Assuming that the greatest pumping demand will be during the periods when the ground water levels are moderately to extremely low, the water levels in TW-6-69 and TW-5-69 could quite conceivably drop to 19.22 feet (5.9m) and 22.92 feet (7,0) after continuous pumping of 90 gpm (6,8 1/s) after 1 year.

#### GEOLOGY

#### Bedrock

The bedrock in the study area consists of Paleozoic sedimentary rocks of Upper Middle Ordovician Age. The Woodville study area is underlain by the Lindsay formation of the Simcoe Group of formations.

Liberty, B.A. 1969: Paleozoic Geology of the Lake Simcoe Area, Ontario; Geol. Surv. Canada, Mem. 355, Dept. of Energy, Mines and Resources, Ottawa.

It is generally grey to greenish grey, fine-grained argillaceous limestone. The Limestone is generally very fossiliferous and includes thin shale partings. Liberty<sup>1</sup> has estimated that the Lindsay formation is approximately 185 feet (56,4m) thick on the east side of Lake Simcoe. Well No. 4712 has penetrated 230 feet (70, lm) of bedrock and may have penetrated the underlying Verulam formation of Middle Ordovician Age. This formation consists of grey limestone with alternating shale and claystone. However, the well record does not distinguish the difference in the lithology of the bedrock. The limestone of the Lindsay formation weathers to a loose rubble on flat surfaces. No bedrock outcrops have been observed in the study area. Regionally, the bedrock surface is inclined to the south west. Bedrock surface elevation data were obtained from the water well records and plotted on a map of the area. It appears that the bedrock surface forms two northeast-southwest trending valleys; one of which is located to the northwest of Woodville while the second valley underlies the southern portion of the town. White Creek appears to flow along the main axis of this valley.

#### Overburden

The overburden in the study area consists of sediments of glacial, glacio-fluvial and glacio-lacustine deposits. The hummocky terrain is due to the presence of drumlins and eskers in the study area. The eskers are oriented generally in a northeast-southwest direction, as are the drumlins. A small esker complex is located immediately south and east of

Woodville; another esker complex starts southwest of Woodville and continues towards Cannington while a third major esker complex is located to the south and east of Woodville. This esker is oriented in a more east-west direction.

The terrain is generally characterized by a clayey to sandy till which was deposited by the Ontario ice lobe during Wisconsinan glaciation. A small silt and clay lake plain is located to the south and southeast of Woodville. This was deposited during the presence of glacial Lake Algonquin in this area. Recent swamp deposits are also noted to the northeast and southwest of Woodville.

The geologic sequence of the overburden is generally a clay and stone or boulder formation overlying the bedrock. Occasionally, a local sand and gravel formation is found between the bottom of the clay and boulders formation and the top of the bedrock. In the areas of the eskers the bedrock is generally overlain by sand and gravel.

The overburden thickness in the study area ranges from 3 feet (0,9m) to 60 feet (18.3m). The overburden was found to be 20 feet (6,1m) thick or less in 60% of the water well records. The esker complex to the south east of Woodville has the thickest deposits of sand and gravel and may be in the order of 50 feet (15,2m) thick.

#### HYDROGEOLOGY

#### General

A rock formation or unconsolidated sediments which can yield usable quantities of water is called an aquifer. The ability of an aquifer to yield water is dependant upon its hydraulic characteristics, its thickness and areal extent, and on the amount of recharge in the form of precipitation which reaches the aquifer.

#### Bedrock

Water in the bedrock moves primarily through interconnected openings such as fractures, joints and bedding planes. Water in interconnected, intergranular pore spaces contributes to storage in the aquifer rather than well yield. The yield from a bedrock well is generally dependant upon the number, size and interconnection of the openings which the well intercepts. As a well penetrates deeper into the bedrock formation, more solution cavaties and/or fractures are likely to be intersected.

The bedrock wells in the study area penetrate from 2 to 230 feet (0,6 to 70,1 m) into the rock; however, the deepest penetrating well resulted in dry conditions. A well penetrating 158 feet (48,2m) into the bedrock did encounter a

domestic supply of water. Of the bedrock water well records studied, 51% of the wells encountered water after 2 to 30 feet (0,6 to 9,1m) of bedrock penetration while another 29% of the wells encountered water with an additional 20 feet (6,1m) of bedrock drilling. Only four wells penetrated more than 100 feet (30,4m) of bedrock, however, two of these wells did not find sufficient quantities of water for domestic demands. From the well data it is seen that 80% of the bedrock wells encounter sufficient water supplies within the first 50 feet (15,2m) of bedrock penetration.

Specific capacity, which is the well yield in gallons per minute per foot of drawdown (litres per second per metre) is a measure of the ability of a well to yield water. The specific capacities of the bedrock well vary from less than 0.01 to 23.3 gpm per foot of drawdown (0,002 to 5,8 1/s/m) with about 68% of the bedrock wells having specific capacities of less than 0.5 gpm per foot of drawdown. The development of solution channels and fractures along bedding planes in the bedrock aquifer is heterogeneous with the result that high and low-capacity wells can be found in close proximity.

#### Overburden

In the overburden, water is transmitted through intergranular openings in the sediments, and hence, the sorting, shape and grain size of the overburden materials affect its ability to transmit water. Water movement through glacial materials varies greatly. Water movement is slow in both vertical and horizontal directions through fine-grained materials such as clay or poorly sorted materials such as till, due to the low permeability of the materials. These materials tend to form poor aquifers. Coarse-grained materials such as sands and gravels have high permeabilities and can be fair to excellent aquifers.

There are several dug wells located in the study area. These wells generally have sufficient yields for domestic supplies, however, several water well records have indicated that some owners having previously dug wells have had to have deeper wells drilled in order to obtain sufficient quantities of water. There are a few drilled wells in the study area that are completed in the overburden. These overburden wells range in depth from 16 to 52.5 feet (4,9 to 16,0m). The specific capacities of these wells range from 0.3 to 10 gpm per foot of drawdown (0,07 to 2,49 1/s/m). The well with the high specific capacity was completed in the esker located to the southwest of Woodville.

Although the sands and gravels of the asker formations are favourable aquifer materials, they are generally found to have only the bottom few feet saturated. Thus the available saturated thickness is the limiting factor of these deposits for water supply production purposes. However, the eskers are good recharge areas and if the eskers are on or near the bedrock surface, they may serve as a means of storage of groundwater to the bedrock.

#### WATER QUALITY

#### Chemical

Eight water samples were collected to assess the chemical quality of the ground water and one sample was taken of White Creek. The sampling was undertaken in Woodville and west and south of Woodville. The results of the analyses are shown in Table 2.

Two of the samples were taken of the town supply at different locations. Both showed very hard water but otherwise, the other parameters except for nitrate concentration, all fall within the Ministry's criteria for public drinking supplies. The nitrate content was found to be 9.7 and 9.9 ppm, extremely close to the Ministry's criterion of 10.0 ppm. This nitrate problem has been investigated and reported in the past. From the present sampling, the problem still appears to be prevalent, as seen in the water sample collected from wells within Woodville. The Lane well, sample location H, although located in the centre of Woodville, showed low nitrate concentrations. This may be due to the fact that no heavy pumpage is imposed on the well and only recently recharged water is being drawn in.

From the samples collected, the total dissolved solids ranged from 266 to 686 ppm. Four well water samples exceeded the Ministry's criterion of 500 ppm for total dissolved solids. The hardness concentration of the water is quite variable from 7 to 532 ppm. The sample with 7 ppm hardness content has been treated by a softener.

The chloride concentration of all the samples falls below the Ministry's criterion of 250 ppm as does the sulphate concentration having the same criterion. Two of the well water samples and that of White Creek exceed the Ministry's criterion of 0.3 ppm for iron content. Although the town supply has an iron content of 0.01 ppm, the operator did indicate that some people on the town supply near the pumphouse reported "flecks" of matter in their water. The operator also indicated that some flecks of matter were observed at the well head. This may be precipitating iron caused by the water level being lowered below the main water bearing zone in the well and, in cascading into the well bore, the oxidation of iron takes place leading to the precipitation of iron.

The area to the west of Woodville appears to have low nitrate concentrations, however, one of the sampled wells had water exceeding the criterion for dissolved solids while another sample well showed an iron content greater than the desired criterion.

Some of the water well records have shown that drilling into the bedrock, particularly deeper into the rock, has yielded water containing high chlorides or sulphurous gas.

#### FAVOURABLE TEST DRILLING AREAS

The overburden aquifer does not appear to be suitable for the construction of high capacity wells, therefore, it appears that any new production wells will have to be drilled in the bedrock.

On the basis of the available hydrogeologic data, the areas shown in Figure 1 appear to be the most favourable for testing. Two of the areas are located near or on the esker complex. Although it is not anticipated that the sand and gravel of the esker will have sufficient saturated thickness to yield large supplies, they may directly overlie the bedrock and thereby, be hydraulically connected with the bedrock aquifer. As a result, the water from the bedrock may be of more acceptable quality than bedrock water in other areas. The water quality in these areas may be favourable except for possibly iron concentrations. The piezometric surface shows that the high nitrates found in the centre of Woodville may not migrate as readily towards these areas as they do towards the present municipal supply.

The sites have also been located on the flanks or centre of the bedrock valleys. The bedrock surface in these locations may be highly weathered from past erosional forces and thereby, the top several feet of the bedrock may have high permeabilities.

These sites are located sufficiently distant from the present municipal supply, whereby, interference from pumping would be negligible, if any. During the test drilling program, data from the pumping tests indicated that about 0.5 feet (0,15m) of drawdown might be anticipated at a distance of 1,000 feet (305m) from the pumped well.

#### CONCLUSIONS

Based on the pumping test and pumping data of the production well, the present town supply is capable of yielding 90 gpm (6,8/s) on a continuous basis from the two wells. Monitoring of the water levels should be continued to determine if this yield is in fact the maximum or whether the aquifer conditions can allow for increased pumping.

The present average daily pumpage is in the order of 30,000 gpd (136,377 1/d) with the maximum day pumpage being just over 40,000 gpd (181,836 1/d). As the pump operation appears to be more daily, the pumpages presently reflect the daily consumption.

Based on the available hydrogeologic data, the overburden aquifer does not appear to be capable of yielding sufficient

quantities of water for municipal supplies. The bedrock is the only aquifer capable of yielding large quantities of water to individual wells, especially where it is hydraulically connected to partially saturated sands and gravels of esker formations.

From the water well records, it appears that a larger quantity of water is derived from the first 30 feet (9,1m) of bedrock. Drilling deeper to 50 feet (15,2m) may yield favourable supplies, however, it appears that with increased depth the chemical water quality changes and the possibility of encountering poorer quality water in the form of higher chlorides and possibly sulphurous odours and gas increases. Therefore, wells drilled to depths of approximately 50 feet (15,2m) may encounter sufficient quantities of water with favourable quality. It is anticipated that the nitrate concentration in the ground water remote from the Village will not be as high as in the Village of Woodville.

The more favourable sites for drilling are described under the heading of "Favourable Test Drilling Areas" and are shown in Figure 1. It is anticipated that local well interference will be minimal and will be dependant upon the rate of pumping of any new well.

#### RECOMMENDATIONS

It is recommended that TW-5-69 be put into production at the noted 40 gpm (3,0 1/s) and the present production will cut back to 50 gpm (3,8 1/s) for a combined yield of 90 gpm (6,8 1/s) if the present supply of 75 gpm (5,7 1/s) is insufficient to meet the near future demand.

It is recommended that any further test drilling be carried out in the areas shown in this report.

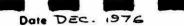
Extended pumping tests should be carried out on any test wells encountering favourable formation to determine their capacity and changes in chemical water quality with respect to pumping time and the anticipated amount of interference, if any, in nearby wells.

Prepared by: D.J. (Andrijiw

Approved by: T.J. Yakutchik

DJA/im

Sector Sector Sector	
Ministry ( Environm	



Prepared by D. J. A.

Well No	Location and Elevation			Owner	Driller	Well Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Pumping Level (feet)	Quality	Use	Remarks. Log etc
2160	MARIPOSA	con KIII		C. Jewerr	year J.F. HENDERSON 1964	•	64	77	33	34	77	Fr	) S	0 dugwell 25 lmst 77 *45
3868	ا ھ در او	RTT	3	J. PARLIAMENT	J.F. HENDERSON	7	64	49	35	2 <b>%</b> 9	35	Fr.	р	0 dug 35 imst. 49 #47
2161				M. BUDD	1.F. HENDERSON	۲	64	58	<b>*</b> 20	4 20	45	Fr	s	Otps1 2 sndy soil 47 #58 Imst 58
2162	" 939	XIII	8	J. Schwaizwald	KING 1957	•	5 %	48	36	у <sub>г</sub> 5	46	FR	D	0 grv1 i cl 48 *42
2167	"	XIV	1	DOBBS	BALDWIN 1965	•	64.	33	в	10	8	FR.	р	0 dug 15 3nd ignel 33 * 28. 32
3933	" 885	XIV	1	E. SMART	J.F. HENDERSON	•	64	31	8	2 9	14	Fr	р	0 tps1 2 cl, stms 16 * 30 cl, snd, grv1 31
5908	" 895	XIV	2	W. TEEFY	FAULKNER 1974	•	64	33	10	3 6	28	Fr	р	Opredniked 22 Imst 33 # 22
5697	" প্রগ্ন			W. TEEFY	FAULKNER 1974	•	64	22	10	2 6	13	Fr	9	Otpel 2 cl grul 20 #22 Imst 22
5451	" 875	<b>NV</b>	2	R. HULBERT	K HART 1973	•	64	36	20	2 7	36	FR	9	0 cl stns 13 1mst 36 * 36
2169	ч 925	XIV	3	R. VAN SCHARK	J.F. HENDERSON 1964		64	75	DRY	·				0 dug 23 1mst 75
2170				R. VAN SCHARK			64	54	14	21/2	52	FR	) S	0 fps1 1 cl stns 20 # 52 1mst 54
2171				C. THOMAS	BALOWIN 1958	•	6	56	20	6.6	40	FR	) s	0 dug <b>3</b> 4 hpn 52 1mst 56 *56

MOE 0488 6/76

----

Ontario MI	vironment					Table Sun									Prepared by	
well No	Loca an Eleva	hd			Owner	Driller	Well Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Pumping Level (feet)	Quality	Use	Remarks. Log. etc	
699	MARIPOSA TWP.	T	con FIV	-	G. LONG	FAULKNER 1974	9	64	60	25	3 21/2	50	Fe	Д	0 tps/2 dgrv1 20 Imst: 60	 ₩5
725	31	928			G LONG	FAULKNER 1974	•	64	100	48	1	وو	Fr	Р	O predrilled 60 lmst 100	
172	11	<del>95</del> 3			T. CROGGS	3ALOWIN 1952	•	64	35	15	4		Fr	S	0 dug 15 cl 30 bid 35 grv1 35+	* 16
173	h	927			I. LICKLAER	BALDWIN 1967	9	10	74	27	2 1½	70	FR	D	0 duy 28 Inst 74	* 70
571	0	340	-	6	W. APPEL	BALDWIN 1968		614	107	25	1/2	-	SA	AB	Od hpn 18 lmst 107	<b>*</b> 98
572	м	935		6	W. APPEL	BALDWIN 1963	6	64	85	15	1/12	-	SA	AB	Odhpn 6 Imst 85	* 80
573	11	950			W APPEL	BALDWIN 1968		64	35	H1/2	35	16	FR	9	O d hpn 13 lmst 35	*3
2174	п	950		8	G. OWENS	BALDWIN		7	69	25	1/2	69	FR	) S	0 d stas 12 last 69	*4
2175					G. OWENS	20		7	128	30	1/12	128	Fæ	) s	0 d stas 15 1mst 128	* 6
21 76	н	942			2	BALDWIN		7	50	24	3	50	Fr	) s	0 dug 26 1mst 50	*49
2177	4	<u>957</u>			G. OWENS	J. F. HENDERSON	' ×	64	60	DR;	/				0 tps12 d stns 12 dish 14 lmst 60	
2178	"	949	-		H. IMRIE	BALOWIN 1958	•	4 1/2	61	10	1/2	61	FR	) 5	O dug 13 drilled 33 Imst 61	*1

.

	inistry of th	e				Table Sun	mary	of Wa	ter W	ell Re	cords				Date
Ontario												92 			Prepared by
Weli No		ocation and levation			Owner	Driller	Well Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Pumping Level (feet)	Quality	Use	Remarks. Log. etc
		-	con	lot		year									
2179	MARIPO	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	XIV	9	H. IMRIE	ALLARD BROS.	1	2	42	18	1	_	Fe	) J	Oclégrul 17 1ms7 42 #40
2180	a	943	XX	8	H. IMRIE	BALDWIN 1959	9	61/2	72	20			FR	) z	1 d bidr 13 sh 20 * 72 Imst 72
2181	15	95v			HIMRIE	J.F. HENDER 50~	9	64	39	18	z 36	23	FR	) D	0 fps1 2 dish16 * 36 1 mst 39
2182	v	949	πV	8	HIMRIE	J.F. HENDERSON	×	64	80	DRY					Octio Imst 80
4680	ų	95 <b>0</b>	XIV	3	B. NEILL	J.F. нандаезон 1971	•	6.	. 47	14	4½ 6	40	Su	s	0 m 2 distas 14 #40 Imst 47
2193	K	700	XV	1	A. CONNING	J.F. HONDORSON		6'4	35	10	52	25	Fæ	D D	0 tps1 2 d 14 d \$ stms 26 #35 sh 35
2194	n	903	XV	z	J. DANCEY	1.F. HENDER JON	•	64	67	35	7 2	60	FR	۶ ور	0 stry cl 14 cl 60 #62 1 mst 67
2195	13	925	XX	5	H. BUDD	J.F. KENDERSON	•	64	37	10	18	20	FR	۵ د	0 tps1 2 cl ¢ crs snd 14 * 30 cl § stns 28 sh ¢ 1mst 37
5709	a	925			F. TREBELC	KAWARTHA		614	20	8	3	16	Fæ	D .	Ocl stas 12 Imst sh 20 #18
2196	11	950	XY	9	H. DIXON	ALLARD BROS.		z	36	18	1/2	z 30	Fr	) s	Odibidri 8 Imst 36 #35
2197	11	950	XV	-	H.DIXON	1 F. HENDERSON 1966		64	50	20	¥2 1	48	FR	Ĵs	Otpil 2 dt sh 8 #30 Inst 50
4681	u		F	T	H. DIXON	J. F. HENDERSON		6	36	16	10	E 30	FR	D	0 1m 2 cl \$ stns 7 1mst 36 #36

Ontario El			-7		Tat			of Wa						-	Prepared by
Well No	Location ond Elevation			Owner	The Article	Driller	Well Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Level	Quality	Use	Remarks. Log etc
98	MARIPOSA TWP. 953	con XV		UNITED CO-OP OF ONTARIO	J.F. H	1962 Norsecon	•	64	58	25	4	50	Su	D	o pil 2 diz Inst 53
581	n				К. н		9	64	45	26	2 20	32	FR	5	Od, bldr, stas 24 last 45
		$\left  \right $													
											+				

Ministry ( Environm	

Prepared by

Date

5

									-						· · · · · · · · · · · · · · · · · · ·
Well No	Locati and Elevati				Qwner	Driller	Well Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Pumping Level (feet)	Quality	Use	Remarks. Log. etc.
			con	lot		year									
536	ELDON TWP. 9	~	Ī	1	H. WACKØRNAGEL	G. HART & SONS	7	64	55	30	5	55	Fæ	) <sub>s</sub>	0 dug 30 lmst. 55 # 3.
537		72	Γ	3	R. VEALE	BALJWIN 1958	¥	7	45	<i>d</i> r√					Octistas 7 last 45
538	."	75	I	3	R. VEA LE	J.F. HENDERSON	¥	64	44	DRY					0 tps1 2 dl 8 sh 16 Imst. 44
539	", 8.	75	Ţ	3	R. VEALE	J.F. HBUDBRSON	×	6'4	40	DRY					0 tpil 2 d 6 sk 14 Imst. 40
540		78	I	4	F. SWEET	J.F. HENDERSON 1965	9	61/4.	55	13	4	50	FR	) s	0 dug 15 1ms+ 55 * 5
3553	к	75			W.KEELER	J.F. HENDERSON 1968	9	64	او	30	112	90	FR	d S	0 dug 13 rK 91 #S
5 42			10 0	5	W. NEWMAN	BALOWIN 1952		61/2	35	10	1	-	FR	2	Ocl 14 snd 15 d snd grol 21 * crs grul 35
543	μ	399	E	5	NEWMAN	BALDWIN 1952	•	64	42	18	1/2		Fe	D	O dug 23 shi imst 27 #4 Imst 47
544				5	A. CAMPBELL		9	2	25	12	42	18	FR	0	Oclibide II Imst 25 +2
545		986			LORNEVILLE DUBLIC SCHOOL	WILSON'S WELL DRILLING		36	16	9	-	-	Fre	School	Otpet 1 cl 7 cl 9 #5 crs grul i bid- 16
546	11				A. NEWMAN	BALDWIN 1966		64	20	13	6	1 16	Fx	9	O d i hpn 18 grul 20 #1
547	12.22				M. COOK	BALDWIN 1966		6/4	32/2	10	8	24	Fr	2	O dug 14 cl, hpn 30 #3 grv1 32 1/2

	nistry of the vironment				Table Sum	mary	of Wa	ter We	il Red	cords				Prepared by
Well No	Location and Elevation	con		Owner	Driller year	well Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Pumping Level (feet)	Quality	Use	Remarks. Log etc
548	el DON TWP. 893			C.KNETT	BALDWIN 1966		64	52 1/2	18	7	40	FR	2	O dug 17 cl, hpn 50 * grul 52 1/2
645	<b>T</b> C		5	R. COLLINS	K. HART 1974	9	64	34	4	2 7	30	FR	б	0 lm 2 d 22 1ms7 34 *.
366	" 925			M. GORDON	K.HART 1974	9	64	50	18	2 24	40	FR	) s	Olm 2 déstas B *3 Imst 50
565	" 921	Ī	3	<b>)</b> . н. о.	BA-DWIN 1963	¥	64	58	10	10	221/2	SA	AB	O I hpn 10 1mst 58 # 5
567	" 898		4	D.H.O.	BALDWIN 1963	$\star$	64	250	DRY					0 tps/ 2 hpn/7 hpn 23 Imst 250
1830	.'' 875	Ī	5	B. MACALPINE	CLOSS WEL DIGGING 1971		30	38%	5	12 10	38	FR	S	0 d 10 digrel 25 #1. d 30 grul 35 d 38 2
586	u 955	-	1	G. G RAHAM	FAULKNER 1964	9	64	85	40	16	85	FR	۶ (	Otpail I de 14 déstas 26 *. Imst 85
587	11 955	I	1	G.GRAHAM	FAULKNER 1964	9	64	103	40	1/6	108	Fx	D	0 tpat / cl 20 cl stas 26 + sh 31 / mst 103
963	к			K.BUKELOW	K. HART 1974	9	64	65	10	2	65	FR	D	0/m2 cléstns 10 * Imst 65
375Z	" 940		1	S. ALGER	J.F. HENDERSON 1969	1	64	25	7	9 <sup>2</sup>	11	Fæ	۵	O tps/ 2 d \$ stns ish 11 \$ Imst 25
588	" 939	T	2	A. BENSON	BALOWIN 1949	. •	4%	34	10	1	-	FR	) S	0 digrul 15 /mst 34 *.
3555	" 950		2	SSUMMERBELL	I F I DI OPP	~	6	74	DRY	/				Otps1, grul 20 1mst 74

-6

Ontario En	vironment			<del>-7</del>		Table Sum				ell Red					Prepared by
well No	c	cation and wation	22		Owner	Driller	Well Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Pumping Level (feet)	Quality	Use	Remarks. Log. etc.
556	ELDON TWP	, T	I		E. SUMMERBELL	J.F. HENDERSON DEB	$\mathbf{X}$	6	50	DRY				10	O tps1, grul 20 Imst 50
89	P1	<del>)</del> 50 [			C. LILLICO	ALLAR) BROS	q	2	71	18	2	25	Fr	)5	O d : 5thr 35 1 mst 71
590		943		3	LILLICO BROS	J.F. HANDERSON 1964	1	64	35	20	1 15	22	Fæ	) s	Opit 5 cl 33 /mst 35 1
513	ţ.	950	_	3	L. THOMAS	J.F. начдаегон 1968	9	6'4	32	15	82	25	FR	D	Otpus 2 d stas 12 d, sh 16 1 mst 32
37	17		Ĩ	1	H. COOLIDGE	BALDWIN 1964	9	614.	52	30	1/2 1	47	F and	9	0 d hpn 20 sh /mst 24 /mst 52
38	р	954	T	1	G KELSEY	FAULKNER 1965	9	64	105	30	1/2 3	100	Fr	ŋ²	o tpsi 1 distas 10 dhpa 50 grul, cl, sad 60 lmst 105
99	u	952	¥	2	H. CJOLIDGE	BALDWIN 1952	9	6	35	15	5/6		FR	D	Ocl 13 1mst 35
00	4	<b>94</b> 9		2	G. COOLIDGE	BALDWIN 1957		6	60	24	2	55	FR	D	0 d 19 /mst 60 *
666	10				R. POLOZ	K. 1+ ART 1974	9	64	50	6	52	50	FR	٦	$\begin{array}{c} O \ d \ \text{$^{1}$ stms 3 $ sh 10 $ ,} \\ I \ \text{$mst 50$} \end{array}$
667	м				W. CHAPMAN			64	57	20	4 2	55	FR	d	0/m 2 d :stms 12 /mst 57

	linistry of the nvironment		Table Sum		of Wat	ter W	all Re	cords				Date
Ontario Err	Vironment				01 110							Prepared by
Well No	Location and Elevation con b	Owner	Driller year	weli Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Pumping Level (feet)	Quality	Use	Remarks. Log. etc.
369	VILLAGE OF WOODVILLE 931	M. AUSTIN	BALDWIN 1950	9	6	27	10	1/20		Fe	D	Od ipbol 9 Imst 27 #.
370	" 932	S. MERRIAM	8A-0WIN 1952	9	6'4	43	29	1/2		FR	р	0 d 61dr 29 1mst 43 #4
3371	۱۱ ۱۱ ۱۱	J.A. CAMPBELL	HART 1953	7	5%	22	12	34		FR	2	Odistns 7 Inst 22 *
33 <i>72</i>	ч 931	R. HAWKINS	HART 1953	1	5	23	14	12		Fx	D	Odistasio Inst 23 *;
3373	" 931	G.CAMPBELL	HART 1953	1	5.	37	26	1/2 1		FR	۵	Opredrilled 18 1 mst 37 *.
3374	" 951	J. CAMERON	HART 1955	9	5	24	و	2 2 2	15	Fæ	9	2 distris 14 lmst 24 #2
3375	" 952	L. COOLIDGE	HAR T 1955	9	5	67	30	1/2		Fæ	D	0 distas 30 lanst 67 #3
3376	ıı 921	O. E. THORPÉ	HART 1955	1	5	44	14	2/3		Fr	D	Odistas 15 last 44 *4
3377	" 929	MCPHERSON	BALDWIN 1956	9	58	45	10	1/2	1/12	Fx	D	0 l 32 1mst 45 #4
3378	" 930	W.J. MCPHERSON	BALDWIN 1957	9	5 %	43	20	1/2		Fæ	9	0 cl 26 1mst 43 #4
3379	" 930	). SPENCE	BALDWIN 1956		5 %	33	20	1/2	r	Fæ	9	12220
3380	" 942	W. CAMERON	BALDWIN 1958	. 1	6	44	10	3	35	Fre	١	O & \$ 510+20 1 mst 44 *

Ministry of the Environment	
--------------------------------	--

Prepared by

Date

و

1

Well No	Location ond Elevation	Owner	Driller	Well Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Pumping Level (feet)	Quality	Use	Remarks. Log etc	
3381	con lot VILLAGE OF WOODVILLE 948	UNITED) CHURCH	HALDWIN BALDWIN 1958	9	6	34	19	32	34	Fæ	)	O d & bid-20 /mst 39	*30
3382	." 932	). BROWNLEE	BALDWIN 1953	7	6	28	10	3	25	FR	D	0 l 12 1mst 28	*26
3383	" 930	R. BURTON	BALDWIN 1958	9	6	168	15	1/2	168	Su FR2	D	0 tpil: bldr 10 1mit 163	*169
3384	" 942	F. OWENS	BALDWINI 1958	9	7	63	31	3'	63	FR	0	0 cl : bld- 29 /mst 63	*55
3385		O. LANE	HART	9	7.	36	7	2 1/2	30	FR	)	Odestas 12 Imst 36	*30
3386	" 936	B. LAMB	BALDWIN 1958	9	7	50	20	2	50	FR	б	O distas Il Imst 50	*40
3387	" 928	M.P. AUSTIN	BALDWIN	9	61/2	29	10	10	29	Fa	)	1 distas B 1mst 29	*29
3388	4	DR. J. ANDORSON	BALDWIN	P	6/2	. 80	25	5	80	FR	)	O d & bldr 40 /mst 80	*70
3389	м	E. THOMPSON	BALDWIN	9	64	454	30	に	1 30	Fre	D	0 dug 242 1mst 4534	*40
3390	" 932	O. LAMB	BALDWIN 1960	9	614		-	-	-	-	2	0 25 hpn 17 1mst 115	
33.91	n	BELL TELEPHONE	K. HART 1961	×	64	115	)RY	/				Odifill 16 Inst 115	-
3392	927 '' 927	BELL TELEPHONE	K. HART 1961		64	50	10	ł	<sup>2</sup> 48	B FR	D	0 2 9 1mst 50	- *48 -

Ontario	Ministry of the Environment
---------	--------------------------------

Prepared by

Date

0

well No	Location and Elevation	Owner	Driller	Well Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Pumping Level (feet)	Quality	Use	Remarks. Log. etc
	con l	ot	year									
393	VILLAGE OF WOODVILLE 929	MRS. J. KING	J.F. HENDERSON 1961	9	64	29	μ	6	e,	FR	Д	0 tps/2 cl 8 sh 10 #2 1mst 29
394	،، 939	MRS.E. KING	J.F. HENDERSON 1961	9	64	24	9	10'	п	Fæ	Ŋ	0 tps12 cl 10 sk 15 #2 1 mst 24
395	" _938	U. FISHER	J.F. HONDORSON 1961	9	64	41	19	3'	24	Fe	2	0 tps/2 cl 12 lmst 4/ #3
3396		F. MCEACHERA	J.F. HENDERSON	7	64	38	15	3'	27	FR	)	0 tpil 2 d 15 sh 16 # 3 (mst 38
3397	" 942	S. NEWMAN	BALDWIN 1961	9	64	404	20	3	35	FR	2	Od 3 hpn 8 1mst 90/4 #2 #3
3398	" 940	CANADIAN	BALDWIN 1961	9	614	34 4	15	4	30	FR	)	O l & hpn 15 1mst 34 7 * :
3400	" 930	KNOX PRES CHURCH	J.F. HENDERON	9	64	60	20	1/2	56	Fre	)	O cl 16 sh 24 Imst 60 *
3401	" 929	A. JEWELL	J.F. HENDERSON	9	64	41	20	12	37	FR	)	0 dug 24 fingral 31 #4 54 41
3402	". 942	J. MONTAGUE	J.F. HENDERSON		64	45	23	22	40	FR	D	0 tps/ 2 cl 16 sh 22 #4 Imst 45
3403	" 942	K. HANDCOCK	J.F. HENDERSON	0	8	47	20	22	2 42	Fr	D	0 tps/ 2 cl istas 12 # 4 cl ish 20 /mst 47
3405		H. CAMERON	J.F. HENDERSON		B	40	14	100	3 34	FR	۵	Odug 6 1mst 40 # 2
3406	"	G. ENGLISH	J.F. HENDERSON		64	54	و	3	50	FR	D	0 tps/ 2 cl 19 1mst 54 #

8	Ministry of the Environment
Ontario	

Date

Prepared by

Cinci i												and the second
Well No	Lacation and Elevation	Owner	Driller	Well Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Level	Quality	Use	Remarks. Log. etc.
	con l	lot	year	1	/		1		1	1/	· · · · ·	
3407	VILLAGE OF WOODVILLE _938	MRS. J. B. CRANGR	BALDWIN	9	64	80	22	34'	70	Fæ	2	Odug 13 hpm #stas 26 * bok mit 23 /mit 80
3408	" 930	BANK OF COMMERCE	J.F. HENDERON	•	61/4	58	18	24	28	FR	2	Odug 18 1mst 53 *:
3409	" 926		J.F. HENDERSON	9	64	17	5	3	15	FR	8	Otpul 2 stry cl 12 #1 1 mst 17
3402		H. WHITFIED	1965		0.4		5		15			
3410	" 92(	M.MCKAQUE	FAULKNER 1964	?	64	64	40	之	63	FR	2	O d'éstas 12 sh Imst15 Imst 69
3411	" 933	H. CAMERON	J.F. HENDERION 1965	$\star$	64.	. 50	DRY				AB	Ostny d 10 1mst 50
3412		H. CAMERON	J.F. HENDERSON	X	1.	80	DRY				AB	Ostny d 12 Imst 80
3413	" 934	H. CAMERON	J.F. HENJERSON 1965		64	50	10	1/2'	1 50	FR	J.	Ostry cl 12 Inst 50 +
3414	" 925	G. DAY	J. F. неньегон 1965		64	36	14	2 15	2	FR	0	0 dug 13 /mst 36 *
	11		J.F. HEN DERSON					+	,			O duy 20 stry cl 43 #
3415	942	L. ARCHIBALD			6/4	76	8	6	65	FR	D	0 dug 20 stry cl 43 * 1mst 76
3416		A. BELL	J.F. HENDERJON 1965		64	68	21	5	60	FR	)	0 d lm 1 sndy cl 8 * cl 46 lmst 69
3417	ţı	DR. J.B. CRAME	BALOWIN		-	55Z		1	40		0	0 pit 5 cl hpn 10 ₩ Imst 55 1/2
3418	11	MRS M CHROUCHMAN	J.F. HENDERSON		64			6	2 29	FR	+	Otps1 2 cl, star, sh 25 Imst 39



Table Summary of Water Well Records



Date

Well No	Location and Elevation con lat	Owner	Driller y <del>e</del> ar	weli Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) (hrs)	Pumping Level (feet)	Quality	Use	Remarks. Log. etc.
	VILLAGE OF WOODVILLE 926	S. MURRAY	BALDWIN 1966	9	64	26 1/2	18/2	×2 15	21/2	Fæ	D	Ohpn 11 /mst 26/2 #26
3420	" 955	B. PETHICK	J.F.HENDERSON 1967	9	64	95	35	4 3	90	Fæ	2	0 tpil / cligrer 44 \$90 /mst 95
3421	" 942	MRS. A. THORN BURY	J.F. HENDERSON 1967	?	64	101	60	y44	101	FR	Э	0 tps/2 cl 12 #90 1mst 101
3422	" 931	PMCARTHY	BALDWIN 1967	7	64	35	15	2/2 2	30	FR	۵	O hpn 19 1mst 35 *18
3567	" 930	E. BARBER	J.F. HENDERSON 1969	•	6%	. 31	15	2 5	25	Fr	Э	0 tps/ 14 1mst 31 #31
3568	" 950	G. ENGLISH	J.F. HENDERSON	1	64	(18	75	10	85	Fre	Д	0 tps 1 6 cl 43 1mst 113 *
3570	" 925	S. KELSEY	BALDWIN 1968	9	64	19/2	. 10	2 10	13	Fæ	D	O l hpn 14/2 sh bok Inst 17/2 cl 18/2 Inst 19/2 *
3512	" 950	J. MONTAQUE	J.F. HENDERSON	· •	64	69	35	4 <sup>2</sup>	60	FR	Ъ	O tpil 2 distas 40 #6 d gri 43 last 69
3786	" 925	0. w R.C. TH-3-69	K. HART 1969	Ŕ	8	41/2	4	21	4 35	FR	M AB	Ocl stas 12 sh 14 # 14 1mst 41 1/2 18
3787	G G	0.W.R.C. TH-1-69		q	8	42	2	40	3 11	FR SA	M	O snd 12 sh 15 1mst 42 #20 #30
3789	4	0.W.R.C. TH-2-69	. K. HART	Ŕ	8	29	8	28	26	FR SA	M AB	Ofill 4 d stms 10 snd 15 #2 sh 16 /mst 29 #25
3789		0 w R C TH-6-69	K. HART 1969	9	8	30	7	60 75		FR		0 l stns 12 1mst 30 # 2 # 2

1.32

s



Table Summary of Water Well Records

Prepared by

Date

Well No	Location ond Elevation		Owner	Driller	Well Type	Well Diameter (inches)	Depth (feet)	Static Level (feet)	Pumping Test (gpm) ( hrs)	Pumping Level (feet)	Quality	Use	Remarks Log etc
		con lot		year									
790	VILLAGE OF WOODVILLE 925		0.W.R.C. TH-5-69	K. HART 1969	9	8	38	8	24 40	15	FR	Μ	Ocl stms 8 grv/ 19 * 1. 1mst 38 3
3791	" 925		0. W. R.C. TH-4-69	K. HART 1969	Ŕ	8	39	B	×4 21	30	FR	M AB	Ocl stris 8 grul 12/2 #1 1mst 39 3
3892	ч 925		J MCINTYRE	J.F. HENDERSON 1969	9	64	93	35	6	82	FR	J	0 tps/ 2 d = stns 14 #5 d sh 22 (mst 93
4711	" 940		H. WEBSTER	BALDWIN 1972	×	614	60	DRY				AB	Odibber 10 sh Imit 19 Imit 60
4712	", 94v		H. WEBSTER	BALDWIN 1972	×	64	240	DRY				AB	0 cl \$ 51dr 10 sk /mst 19 1mst 240
4713	" 25Ce_		R. JONES	BALDWIN 1972	9	6'4	60	15	2	40	FR	9	Odibldr 15 Imst 60 #
												*	
				-		-					-		



Table 2 Summary of Water Analyses

Prepared by J.K. Yee

												Che	mical (	Constitu	ents in	parts p	er milli	ion (pp	m )			
Source and Number	Location	Date Sampied	рн	Colour Hazen Units	Turbidity Jackson Units	Conduct	Torai Dissolved Solids (PPm)		Alkalinity as CaCO3 (PPM)	Chior de 'C',	Suiphaie SO <sub>4</sub> ,	lron (Fe)	Calcium (Ca)	Magne- sium (Mg)	Sodium 'Na,	Potasium 1 K j	Fr <b>ee</b> Amonia	Totel Kjeldahl	Nitrite	Nifrate	Remarks	_
Bryan Residence (Town supply)	Woodville Area	Feb.7/	7.3			650	372	348	268	21	33	.01	123	10	8	29	.1	.1	.02	97		-
Jones Well 3387	n	"	7.1			1140	686	532	382	88	63	.03	162	31	41	120	.1	.2	.03	17.0		_
Hembruff Wel: 3377			7.2			1000	636	472	303	106	43	.06	162	16	30	4.9	.1	.1	.01	12.0		_
Cameron Residence (Town supply)	н	"	7.4			670	392	357	278	22	33	.01	126	10	8	3.1	.1	.1	.01	99		-
White Creek at Hwy. 46	n		7.9			610	386	330	268	19	27	11.58	115	10	6	2.4	.1	.7	.03	68		-
Fiske Well	п		7.4			1100	640	451	406	120	34	.09	157	14	72	20	.1	.2	.01	.4	Rock 18	' de
Lane Well 3385			7.4			810	456	381	313	64	56	.69	88	39	36	4.7	.2	.3	.01	.1		_
White Well	н	•	7.4			850	522	7	263	42	92	.03	3	.1	205	1.3	.1	.2	.02	10.0		_
Baker Well		"	7.7			480	266	264	233	9	34	.86	52	8	7	2.1	.1	.1	.01	.1		
																						-
							+	-														-

MOE 07-049

